

REMARKS

This paper responds to the Office Action mailed on February 14, 2007.

Claims 45, 46 and 48 are amended, no claims are canceled, and no claims are added; as a result, claims 45-58 are now pending in this application.

Objection to the Specification

The specification is objected to under 37 CFR 1.71, as being so incomprehensible as to preclude a reasonable search of the prior art by the examiner, as set forth on Office Action page 2. Applicant respectfully submits that the specification is easily understood by one of ordinary skill in the art. Specifically, the Office Action states that "Claim 45 requires that "a material" be deposited in a site, and simultaneously be etched from the site. The specification does not support this claim." Applicant respectfully disagrees and submits that one of ordinary skill in the art understands that the taught "decreasing the deposition rate and increasing the bias of the settings" will result in a competition between a deposition reaction and an etch reaction, such as for example may be found in many types of what may be known as "selective" deposition reactions. One of ordinary skill would easily understand from examination of the figures 7 and 8, and the associated text, that obviously the conductive material 20 could not be etched away on the top portion 12 of the insulator layer 18, while remaining inside the contact hole 14 "simultaneously" with the formation of "an etch resistant layer 80" inside the contact 14 (see present specification page 8, lines 11-15), unless the deposition of the etch resistant material was being removed at least as fast as it was being formed. If the etch resistant material 80 was formed both inside and outside the contact 14, then the conductive material 20 could clearly not be simultaneously be etched, since the conductive material would be covered by the etch resistant material.

Applicant respectfully submits that the specification plainly supports the recitation of the claims, as would be easily understood by one of ordinary skill in the art. Applicant respectfully submits that the specification is easily understood by one of ordinary skill in the art, as shown above with respect to the specific example given in the outstanding Office Action, and requests that the Examiner provide other examples of difficulty with understanding the specification's teachings. Applicant respectfully requests that the objection be withdrawn.

§112 Rejection of the Claims

Claims 45-47 and 54-57 were rejected under 35 U.S.C. § 112, first paragraph, as lacking enablement. Specifically, the outstanding Office Action states that “one of ordinary skill would not be reasonable applying of how to deposit a material while simultaneously etching it, and the specification does not reasonably explain how to perform these acts simultaneously”. Applicant respectfully disagrees, and notes that in the specification at least at page 7 line 16 to page 8, line 11, teach that the competing deposition and etch reactions may result in the formation of the etch resistant layer 50 only in the contact 14, and not on the top surface 12. This balance occurs at the specifically given on page 6, lines 7-12; page 7, line 19; and page 8, line 12, and noted to provide selective deposition “within the contact 14” and “without the etch resistant layer forming on the wafer surface 12” (see at least page 7, lines 18-19).

Applicant respectfully submits that the specification clearly teaches one of ordinary skill in the art to make and use the invention. Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claims 48-53 and 58 were rejected under 35 U.S.C. § 112, first paragraph, as lacking adequate description. In particular, the Office Action states that there is not support for forming the resistant layer while etching the conductive layer. Applicant respectfully notes that claim 48 recites: “plasma etching a conductive material in the same general site used to perform said deposition.” Applicant respectfully submits that claim 48 does find support in the specification, at least in the third embodiment, which discloses and enables the deposition of a material, and simultaneous etching of a conductive material. This is also shown in the figures 7 and 8, which states that etching the conductive layer 20 occurs “simultaneously” with deposition of layer 80 at least at page 8, lines 11-19. Claims 49-53 depend on claim 48, and are thus also enabled. Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 48-55.

Claim 55 recites: “The method of claim 45, wherein etching said material in the same general site used to perform said deposition includes etching a conductive layer from a surface of the wafer.” Applicant respectfully submits that the third embodiment disclosed in the specification teaches etching a conductive layer simultaneously with depositing an etch resistant layer. Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claims 45-46 and 48 were rejected under 35 U.S.C. § 112, second paragraph, for indefiniteness. Specifically, the Office Action states that it “is unclear how the term “general” is intended to modify either of the terms “site” and “simultaneously” and one of ordinary skill in the art would not be reasonably apprised of the scope of the claim protection intended”.

Applicant respectfully disagrees with the rejection, but to advance the prosecution of this application, Applicant has amended claims 45, 46 and 48 to respond to the Examiner’s comments. Applicant respectfully requests reconsideration and withdrawal of this rejection.

§103 Rejection of the Claims

Claims 45-47, 54 and 56-57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Guldi et al. (U.S. 6,267,122) in view of Marks et al. (U.S. 5,204,288). Applicant respectfully traverses this rejection.

The newly cited reference of Guldi discloses an ammonium or amide aqueous solution without oxidizers for cleaning wafers having exposed titanium nitride surfaces, to remove particles. Applicant respectfully submits that the “deposition of a material 112 in a site over the wafer” is the etch residue formed on the sidewall of the photoresist layer 110 during the etching and removal of the titanium nitride layer 103, the aluminum layer 106 and the titanium nitride layer 102, and is not a deposition process, as understood by one of ordinary skill in the art, but rather a contamination. Guldi only teaches and suggests an etch reaction to remove metal.

Marks apparently discloses a method of providing and/or etching an insulative material. Applicant cannot find any disclosure or suggestion in the cited Marks reference of etching a conductive material simultaneously with performing a deposition. Thus, Applicant respectfully asserts that the Office Action has not established a prima facie case of obviousness, because the cited combination does not disclose all elements of claim 48. The Office has admitted in the past that Marks does not disclose etching of a conductive layer.

Applicant respectfully submits that the suggested combination of references fails to describe or suggest the claimed features of “...performing a deposition of said material over said wafer in said site, wherein said deposition occurs at a greater rate within said site than above said features; and etching said material in the same general site...”, as recited in claim 45, as

amended herein. The claim clearly states that the same material is being etched and deposited in the same general site, whereas the cited reference of Guldi is etching metals over an oxide layer, while a polymer contamination is building up at a different location over the photoresist layer.

The same or similar reasoning may be used to show that the other claims are not described or suggested by the combination of references. Applicant respectfully requests that this rejection be reconsidered and withdrawn.

RESERVATION OF RIGHTS

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney David Suhl at (508) 865-8211, or the undersigned attorney at (612) 349-9587 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date

14 May '07

By



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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 14 day of May, 2007.

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Signature

